

Introduction To Unix Editing Tools

Steve Gallo and Andrew Bruno

Center for Computational Research
University at Buffalo
State University of New York

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Introduction

There are many editors to choose from, both graphical and text-based.

- VIM
- Emacs
- Gedit
- Nano
- Sublime Text 2



... and the list goes on

http://en.wikipedia.org/wiki/List_of_text_editors

Review – Environment Variables

Environment variables control various aspects of your environment and applications. These can be set in your login scripts, by applications, or on the command line

```
bash: export EDITOR=/usr/bin/emacs
```

```
csh: setenv VISUAL /usr/bin/vi
```

Useful environment variables

- **EDITOR** and **VISUAL** – set the editor used by various applications
- **PATH** – A colon-separated list of directories searched for applications to run (e.g., `PATH=/bin:/usr/bin:/usr/local/bin`)
- **HOME** – Your home directory on the machine

Review – Job Control

Unix supports the notion of foreground and background processes. When you run an application (i.e., a job) from the command line it typically runs in the foreground, but you can also run it in the background using the “&” operator.

```
# Run emacs in the foreground. The shell waits for you to exit emacs.
$ emacs test.c

# Run emacs in the background - you are returned to the shell.
$ emacs test.c &
$
```

Use C-z to suspend an job and return to the shell. Type “bg” to continue running the job in the background or “fg” to return to the job. Useful for suspending a job to perform a task and then returning to it. For example,

```
# Use vi to edit a file but you forgot to do something and don't want to lose your
place!
$ vi test.c
  ^Z

# The less command is now suspended
$ cp /some/file .
$ jobs
[1]+  Stopped                  vi test.c
$ fg
# Now you're back in vi where you left off
```

Editors

Emacs and Vim are commonly installed on Unix systems.

Topics

- Opening and saving files, navigating, selection, cut-and-paste
- Auto-completion, syntax highlighting, modes
- Advanced editing: buffers, regions
- Exercises

Advanced Topics for Programmers

- Customizations
- Remote editing



≠



Emacs

Guided Tour

<http://www.gnu.org/software/emacs/tour/>

Online Manual

http://www.gnu.org/software/emacs/manual/html_mono/emacs.html

Need a better editor for Windows? Use Emacs!

<http://ftp.gnu.org/gnu/emacs/windows/>

Help from within Emacs

M-x info

M-x help



Emacs – Notation

M-x is used to run a command

Stands for Meta-x (modifier) and means press the escape key followed by “x”

For example, **M-x tetris** starts a tetris game

Use tab twice to see all commands that start with a string or all available options!

```
Click <mouse-2> on a completion to select it.
In this buffer, type RET to select the completion near point.

Possible completions are:
cua--prefix-copy-handler      cua--prefix-cut-handler
cua--prefix-override-handler  cua--prefix-repeat-handler
cua--shift-control-c-prefix   cua--shift-control-x-prefix
cua-cancel                    cua-copy-region
cua-cut-region                cua-debug
cua-delete-region             cua-exchange-point-and-mark
cua-help-for-region           cua-mode
cua-paste                     cua-paste-pop
cua-repeat-replace-region     cua-replace-region
cua-scroll-down               cua-scroll-up
cua-selection-mode            cua-set-mark
cua-set-rectangle-mark        cua-toggle-global-mark
```

```
-U:%%- *Completions* All (1,0) (Completion List)---Wed Jun 20 10:29AM 0.93---
M-x cua-
```

C-x is a shortcut for a command, typically followed by a command key

Press the control key at the same time as “x” typically followed by a shortcut key

For example, **C-x C-s** will save your file

Emacs – Entering and Exiting Files

Two modes of operation: In its own window (graphical mode) or within a terminal (text mode - useful for editing files remotely).

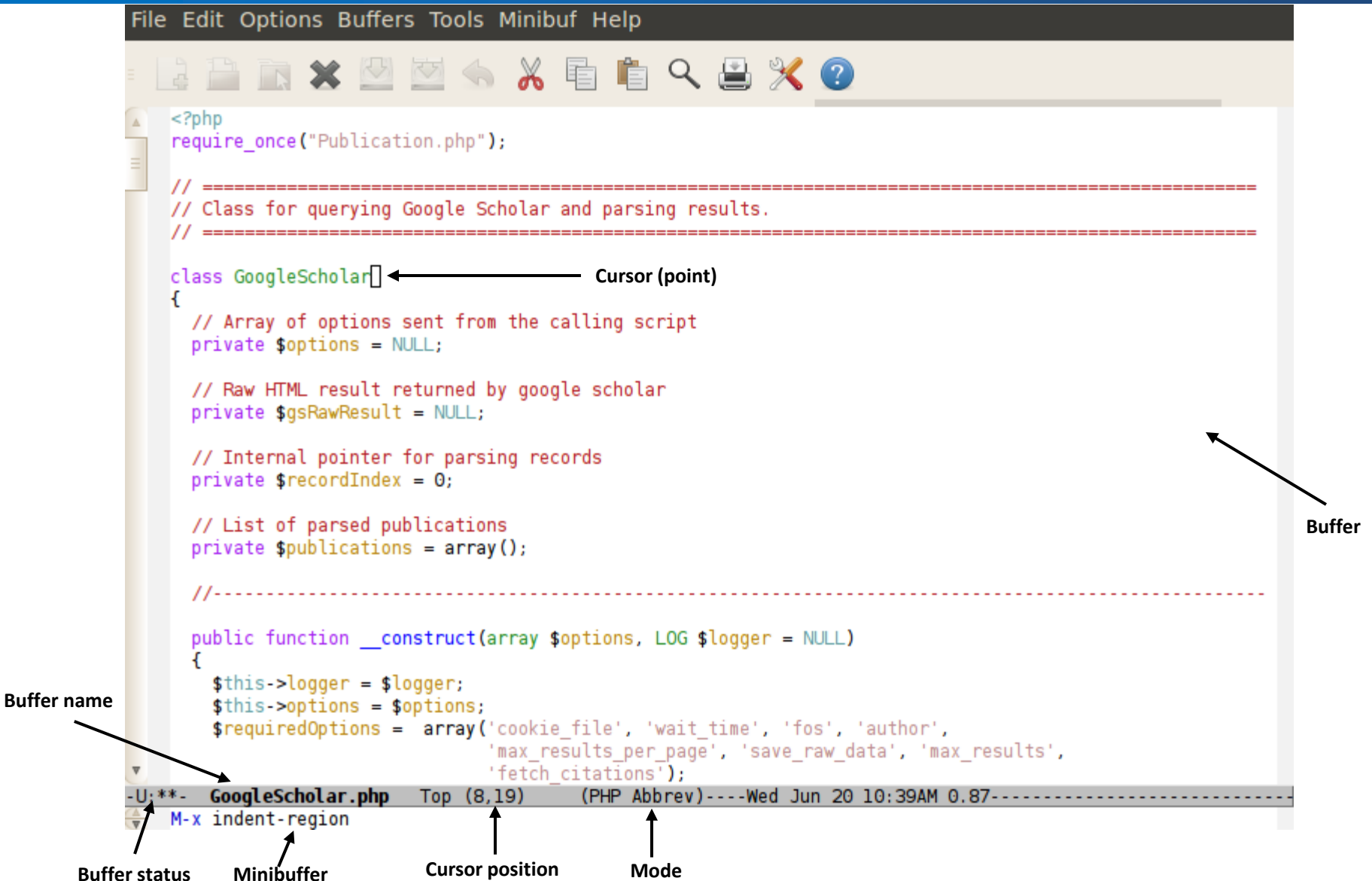
```
# Run emacs in "no window" mode within a terminal
$ emacs -nw GoogleScholar.php

# Run emacs in its own window (in the background)
$ emacs GoogleScholar.php &
$
```

How do I exit Emacs and save my work?

Key	Description
C-x C-s	Save a buffer to its file
C-x s	Save all modified buffers
C-x C-w	Save as
C-x C-c	Exit (asks to save any modified buffers)

The Emacs Window



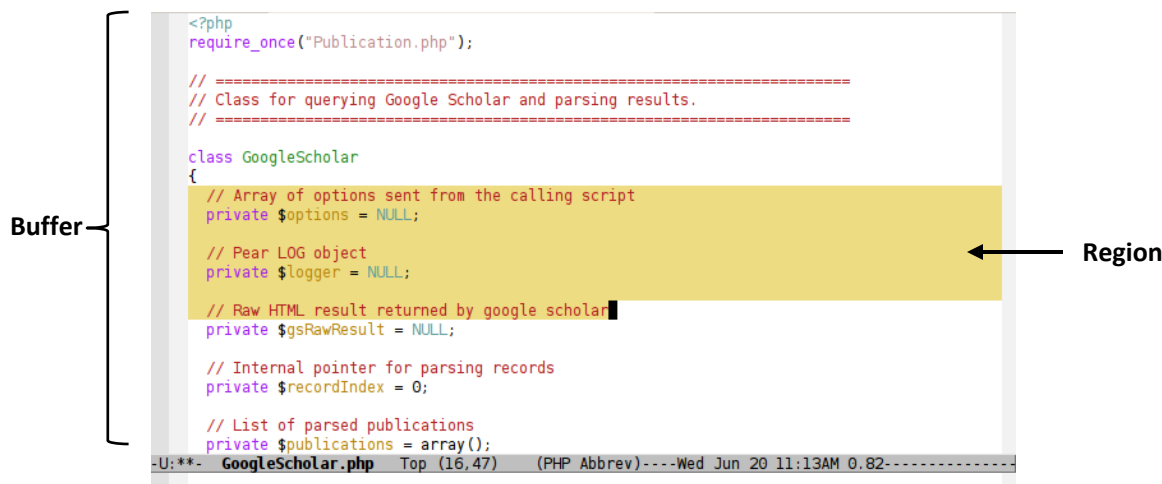
Emacs – Buffers and Regions

Buffers

- Any text being edited (such as a file) is contained in a buffer
- A buffer doesn't have to contain data from a file!
- Every buffer has a name - typically the name of the file
- You can switch between buffers (using C-leftmouse in graphical mode or C-x b)
- You can split buffers to view several on the screen at once

Regions

- A region is a marked area within a buffer (e.g., a selection)
- Many operations can be performed on an entire buffer or a region



Emacs – Moving Around

The arrow keys let you move around easily within Emacs, but to be more productive you can also use command keys!

Key	Description
arrows	up, down, left, right
C-p , C-n , C-b , C-f	up, down, left, right
C-arrow	Same as arrow but moves a whole word
C-a (or Home key)	Move to the beginning of the line (also works in the shell)
C-e (or End key)	Move to the end of the line (also works in the shell)
C-v and M-v	Page down and Page up
M-g g	Go to line (I aliased this to M-: and yes I stole it from vi!)
M-< and M->	Move to the top of the buffer and move to the bottom

Why use **C-a** instead of the home key or **C-f** instead of the arrow? Isn't that crazy?

No! If you have one hand on the keyboard and one on the mouse every time you take your hand off of the mouse to click a key it slows you down. The same is true for copy and paste – if you take your hands off the keyboard to use the mouse menu it slows you down. Learning shortcuts can make you more productive.

Emacs – Cut and Paste

Cut and paste in emacs is called “kill” and “yank”. Killing text puts that text into a buffer that you can then yank back out.

Key	Description
C-k	Kill a line from the cursor to the end of the line
C-y	Yank the contents of the kill buffer back into the document
C-d	Delete a single character under the cursor
Backspace	Delete the character before the cursor
M-x cua-mode	Don't like C-k and C-y ? Set Common User Access (CUA) mode! C-x , C-c , C-v , and C-z become cut, copy, paste, and undo.

Cut and paste also works with regions. Select a region using the mouse in graphical mode or command keys. Move the cursor to another location and kill the text in the region. Regions are useful – more to come.

Key	Description
C-<space>	Set the mark at the cursor
C-w	Kill from the mark to the cursor

Emacs – Working With Rectangles

We often need to operate on rectangular regions of text within a document. Delete a column, move it elsewhere, clear a column, etc. To select a rectangle, set the mark at one corner and move the cursor to the opposite corner.

Key	Description
C-x r k	Kill the rectangle
C-x r y	Yank a killed rectangle
C-x r o	Insert blank space into the marked rectangle, moving the current contents to the right.
C-x r c	Clear the rectangle leaving a blank space

Emacs – Opening Files

Emacs can open several files at once, either from the command-line or within Emacs itself.

```
# Open two files. The files will be displayed in a split window
$ emacs GoogleScholar.php sample.txt &
```

When opening a file from within emacs you can use tab-completion to browse for a file or enter `dire` (directory edit) mode to select a file.

Key	Description
C-x C-f	Browse or open a file
C-x C-r	Browse or open a file read-only
C-x k	Kill the current buffer and close the file

Emacs – Viewing Multiple Files

You'll often be working on multiple files and will want to view them at the same time. You can open multiple buffers or windows (frames), split the window horizontally, or split the window vertically.

Key	Description
C-x 2	Split the current buffer horizontally into two
C-x 3	Split the current buffer vertically into two
C-x o	Switch to o ther buffer (cycles through multiple buffers)
C-x 0	Delete the current window
C-x 1	Delete all windows EXCEPT the current window
C-x 5 2	Open a new window (frame in Emacs-speak)

```
File Edit Options Buffers Tools PHP C Help
<img alt="Navigation icons: back, forward, home, search, etc." data-bbox="111 102 382 135"/>
class RisCitation
{
    private $rowData = NULL;
    private $url = NULL;
    private $file = NULL;
    private $data = array();

    // Mapping between RIS tags and citation data members
    //
    // See http://en.wikipedia.org/wiki/RIS_%28file_format%29

    private $tagMap = array('TY' => "type",
                            'TI' => "title",
                            'AU' => "authors",
                            'AL' => "authors",
                            'AI' => "authors",
                            'AD' => "address",
                            'AB' => "abstract",
                            'KW' => "keywords",
                            'PY' => "year",
                            'PB' => "publisher",
                            'N1' => "note1",
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```

```

File Edit Options Buffers Tools Help

[Icons: File Explorer, Print, Copy, Paste, Undo, Redo, Find, etc.]

Unit_id hospital_id year quarter month <
34 6 2010 4 10 RN stayed in hospital, le
34 6 2010 4 11 RN stayed in hospital, le
34 6 2011 1 1 LPM/LVN stayed in hospita
34 6 2011 1 1 LPM/LVN left hospital o
34 6 2011 2 5 RN left hospital retirem
34 6 2011 3 7 LPM/LVN left hospital o
34 6 2011 3 7 LPM/LVN left hospital c
35 6 2010 4 11 RN stayed in hospital, le
35 6 2011 3 9 RN left hospital perform
36 2011 1 1 RN stayed in hospital, le
36 2011 1 1 UAP stayed in hospital, le
36 2011 2 5 RN stayed in hospital, le
37 6 2011 1 3 RN left hospital retirem
37 6 2011 3 7 RN left hospital spouse/
37 6 2011 3 7 UAP left hospital unkn
38 6 2011 1 1 RN stayed in hospital, le
38 6 2011 1 1 RN stayed in hospital, le
39 6 2011 2 5 RN stayed in hospital, le
39 6 2011 4 10 RN left hospital job rel
39 6 2011 1 1 RN left hospital retirem
39 6 2011 1 3 RN left hospital non-job
39 6 2011 2 4 RN stayed in hospital, le
39 6 2011 3 7 RN left hospital join tr
39 6 2011 3 7 LPM/LVN stayed in hospita
39 6 2011 3 9 RN stayed on unit, left p
40 6 2011 3 1 RN left hospital perform
40 6 2011 1 1 LPM/LVN left hospital o
40 6 2011 1 1 RN stayed in hospital, le
40 6 2011 2 1 LPM/LVN left hospital j

----- staffing mix.tx Top (1,0) (Text) -----
unit_id hospital_id year quarter month
34 6 2010 4 10 546740276046312 0.2720
34 6 2010 4 11 56624097534585 0.2330
34 6 2010 12 550758643253022 0.2920
34 6 2011 1 2 469615204324256 0.1500
34 6 2011 1 3 4706913196670609 0.1918
34 6 2011 1 1 470238851108548 0.1716
34 6 2011 2 6 529720499951962 0.2764
34 6 2011 2 4 5694446267149659 0.1966
34 6 2011 2 5 506677671119694 0.1744
34 6 2011 3 3 4309708971316993 0.1433
34 6 2011 3 4 530454074769898 0.1877
34 6 2011 3 9 612713577283963 0.1877
35 6 2010 4 11 61318456623591 0.1596
35 6 2010 4 12 611306922724841 0.1599
35 6 2010 4 10 442637882500346 0.1762
35 6 2011 1 1 56720809630412 0.2041
35 6 2011 2 4 49242293029746 0.1320
35 6 2011 1 3 4105858547118591 0.1246
35 6 2011 1 2 392664617274859 0.2025
35 6 2011 2 5 381519962633598 0.2001
35 6 2011 2 6 572134954369188 0.1454
35 6 2011 3 8 448657260696138 0.1742
35 6 2011 3 9 486927797162018 0.2125
35 6 2011 3 1 574128151723552 0.1461
35 6 2010 4 10 66764568604569 0.1551
35 6 2010 4 11 652279708708973 0.1471
35 6 2010 1 1 549437578040478 0.1659
36 2011 1 1 527768728727859 0.2376
36 2011 1 2 612040548541285 0.1899

```

Emacs – Modes

Every buffer in Emacs has a mode associated with it based on the type of data being displayed. Modes modify Emacs' behavior to support common operations on the type of file being edited and sets the mode automatically based on the file extension.

Indentation, highlighting of expressions and key words, and other language-specific features are affected by the mode.

Modes are highly customizable (but that is an advanced topic...)

Key	Description
M-x php-mode	Automatically indents code blocks, adds highlighting
M-x text-mode	Sets text mode. Automatically wraps text at 80 characters (can be changed)
M-x auto-fill	You can turn off auto fill mode while in text mode. This can be useful for editing data files.

Emacs – Useful Features

Symbol completion while programming

```
scholarL M-<tab>  
scholarList  
scholarListOfPublications  
...
```

Entering multiple characters at once

```
<esc> 80 -  
-----
```

Adaptive fill mode

- Create Simon & Carol an iRods account
- Multiple zones connected to 2 different irods instances? (split Michigan public/private)
- Search fields
- Rule to read metadata from imported file and add to metadata

- Create Simon & Carol an iRods account Multiple zones connected to 2 different
- irods instances? (split Michigan public/private) Search fields Rule to read
- metadata from imported file and add to metadata

Undo

Key	Description
M-<tab>	Cycle through possible symbol completions
<esc> <number> <char>	Insert <number> of <char>
M-x filladapt-mode	Enable adaptive fill mode
C-x u	Undo recent editing

VIM



Introduction

“Emacs is a hideous monstrosity, but a functional one. On the other hand, vi is a masterpiece of elegance. Sort of like a Swiss Army knife versus a rapier.”

--The Cult of vi

History of vi

- vi was originally written by Bill Joy in 1976 while at Berkeley
- Bill Joy is a co-founder of Sun Microsystems and creator of csh among many others
- vi is based off ex and ed, the original line editor for Unix written by Ken Thompson

History of vi..

- vi has many ports and clones
- VIM is a vi clone written by Bram Moolenaar that adds many advanced features
- VIM - **Vi IM**proved
- First public release was in 1991
- VIM is included with almost every Linux distribution
- Also has a GUI version called gVim

VIM Basics

VIM is a modal editor

- Three basic modes of operation: **insert**, **visual**, and **command**
- By default, VIM is run in command mode. Each mode is accessed by pressing a key and **ESC** returns to command mode.
- To insert text you need to switch to insert mode by pressing **i**
- Visual mode allows you to highlight text. To enter visual mode press **v**
- To view the VIM user manual type **:help** or **:help [command]**
- Even will explain the meaning of life **:help 42**

VIM – Entering and Exiting Files

Type **vim** (or just **vi**) in the shell to start. When vim starts you'll be in normal (command) mode.

```
# Run vim
$ vim hello-world.c
```

How do I exit **vim** and save my work?

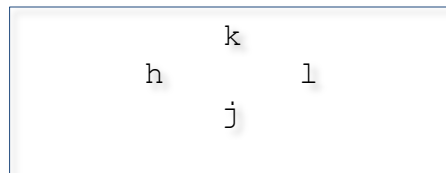
Command	Description
:w	Save a buffer to its file
:wa	Save all modified buffers
:w newfile	Save as
:q	Exit
:q!	Exit without saving changes

VIM – Moving Around

While in command mode:

Key	Description
k,j,l,h	up, down, left, right
arrows	up, down, left, right
w	Same as above but moves a whole word
0 (zero)	Move to the beginning of the line
\$	Move to the end of the line
C-f and C-b	Page down and Page up
12g or :12<Enter>	Go to line, (example go to line 12)
gg G	Move to the top of the buffer and move to the bottom
ESC	Return to command mode
/ ?	Search forward and Search reverse
yy p	Copy entire line and paste

Try using the “home row” for moving around. It allows you to navigate your file without moving your hand over to the arrow keys.



VIM Resources

- VIM – <http://www.vim.org>
- Cheat Sheets – http://www.viemu.com/a_vi_vim_graphical_cheat_sheet_tutorial.html